

SPECIFICATION

Title

~~COUPLING FOR PIPE~~, APPARATUS AND RELATED METHODS FOR PIPE

COUPLING

Brief Description of the Drawings

[1] FIG. 1 is a side view of a corrugated pipe embodiment of the invention, including a central rubber/elastic gasket element, one of the many ways in which the invention can be practiced;

[2] FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

[3] FIG. 3 is similar to FIG. 2, but illustrates the two pieces of pipe assembled with each other, with the central rubber/elastic gasket element between them;

[4] FIG. 4 is similar to FIG. 1, but illustrates one of the many alternative embodiments of the invention, in which a single piece of pipe has a temporary stretch-retaining element positioned in a female end;

[5] FIG. 5 is a sectional view taken along line 5—5 of FIG. 4;

[6] FIG. 6 is similar to FIG. 5, but illustrates removal of the temporary stretch-retaining element and preparation for assembly of a second piece of pipe to the first piece of pipe;

[7] FIG. 7 is similar to FIG. 5, but also illustrates the other end of the first piece of pipe and a preferred application of force to accomplish the engagement of that first piece of pipe with a second piece of pipe at the right-hand side of the figure;

[8] FIG. 8 illustrates another of the many alternative embodiments of the invention, in which the temporary stretch-retaining element is configured as an inverted U-shaped ring that has been cut across its lengthwise axis at one portion of the ring, to permit the ring to be slightly compressed or expanded in its diameter;

[9] FIG. 9 is a sectional view taken along line 9—9 of FIG. 8;

[10] FIG. 10 is a sectional view taken along line 10—10 of FIG. 11, showing a preferred assembly of the various elements of FIGS. 8 and 9;

[11] FIG. 11 is similar to FIG. 8, but illustrates a preferred assembly of the various elements from that FIG. 8;

[12] FIG. 12 illustrates yet another of the many alternative embodiments of the invention, in which the pipe sidewall is a “mono” layer;

[13] FIG. 13 is a sectional view taken along line 13 of FIG. 12;

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(in. 14)
[14] FIG. 14 is similar to FIG. 3, but shows only the female pipe end and illustrates an alternative gasket element; ~~and~~

[15] FIG. 15 is similar to FIG. 14, but illustrates one of the many ways in which an O-ring sealing element may be used with the invention;

[16] FIG. 16 illustrates a stretching tool for use in connection with one embodiment of the present invention;

[17] FIG. 17 is a sectional view taken along lines 17-17 of FIG. 16; and

[18] FIG. 18 is a sectional view taken along lines 18-18 of FIG. 17.

Description of Preferred Embodiment

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93 [25] Finally, FIGS. 16-18 illustrate a stretching tool 90 for use in connection with the apparatus of the present invention ~~Claim 1~~, including a channel or path 92 into which an edge 94 of the first piece of pipe 96 can be inserted in its originally fabricated shape. Preferably, the tool 90 includes means to temporarily deform the edge 94 into the female end configuration discussed above, so that the end 94 is then capable of receiving a non-deformed male end of a second pipe piece, a "stretch-holding" element such as element 40 or 50 discussed above, or the like. The means to temporarily deform the edge 94 can include a wide variety of elements, including without limitation a plurality of rollers 98 mounted on a handle 99. Persons of ordinary skill in the art will understand that the rollers 99 are positionable along the inside and outside surfaces of the eventual female end of the first piece of pipe, and a means for exerting force to deform the eventual female end is provided by any suitable means, including without limitation by applying leverage/torque to the handle 99 to "bend" the edge 94 as shown in FIG. 16.